

Client's ref.: 92068

Our ref: 0548-10294US/final/王琮郁(spin)/Steve

What is claimed is:

1 1. A method of forming an interlayer dielectric
2 layer, comprising the steps of:

3 providing a substrate;

4 forming a dielectric layer containing boron and
5 phosphorous overlying the substrate;

6 performing a plasma treatment on the dielectric layer
7 containing boron and phosphorous;

8 In-situ formation of a capping layer overlying the
9 dielectric layer containing boron and phosphorous
10 to serve as the interlayer dielectric layer with
11 the dielectric layer containing boron and
12 phosphorous; and

13 performing a reflow process on the interlayer
14 dielectric layer.

1 2. The method as claimed in claim 1, wherein the
2 dielectric layer containing boron and phosphorous is a
3 borophosphosilicate glass (BPSG) layer.

1 3. The method as claimed in claim 2, wherein the
2 dielectric layer containing boron and phosphorous has a
3 thickness of about 4000 to 10000Å.

1 4. The method as claimed in claim 1, wherein the
2 plasma treatment is performed using an inert gas as a
3 process gas.

1 5. The method as claimed in claim 4, wherein the
2 inert gas comprises argon or nitrogen.

Client's ref.:92068

Our ref: 0548-10294US/final/王琮都(spin)/Steve

1 6. The method as claimed in claim 1, wherein the
2 plasma treatment is performed at 600 to 700°C.

1 7. The method as claimed in claim 1, wherein the
2 plasma treatment is performed for 5 to 20sec.

1 8. The method as claimed in claim 1, wherein the
2 capping layer is an undoped silicate glass (USG) layer.

1 9. The method as claimed in claim 8, wherein the
2 capping layer has a thickness of about 120 to 140Å.

1 10. A method for preventing formation of etching
2 defects in a contact, comprising the steps of:

3 providing a substrate;

4 forming a borophosphosilicate glass layer overlying the
5 substrate;

6 performing a plasma treatment on the
7 borophosphosilicate glass layer;

8 forming an in-situ undoped silicate glass layer
9 overlying the borophosphosilicate glass layer to
10 serve as an interlayer dielectric layer with the
11 borophosphosilicate glass layer;

12 performing a reflow process on the interlayer
13 dielectric layer; and

14 etching the interlayer dielectric layer to form at
15 least one contact opening therein to expose the
16 surface of the substrate.

1 11. The method as claimed in claim 10, further filling
2 the contact opening with a conductive plug.

Client's ref.: 92068

Our ref: 0548-10294US/final/王琮郡(spin)/Steve

1 12. The method as claimed in claim 10, wherein the
2 borophosphosilicate glass layer has a thickness of about
3 4000 to 10000Å.

1 13. The method as claimed in claim 10, wherein the
2 plasma treatment is performed using argon as a process gas.

1 14. The method as claimed in claim 10, wherein the
2 plasma treatment is performed using nitrogen as a process
3 gas.

1 15. The method as claimed in claim 10, wherein the
2 plasma treatment is performed at 600 to 700°C.

1 16. The method as claimed in claim 10, wherein the
2 plasma treatment is performed for 5 to 20sec.

1 17. The method as claimed in claim 10, wherein the
2 undoped silicate layer has a thickness of about 120 to 140Å.